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chemical analysis was made by Booth, Barrett, and Blair of Philadelphia, and was submitted to the writer by Dr. Geo. P. Merrill. It follows:

SiO ₂ -----	2.910%
Al ₂ O ₃ -----	1.610%
Fe ₂ O ₃ -----	81.595%
P ₂ O ₅ -----	0.621%
CuO -----	0.038%
NiO -----	1.999%
CoO -----	0.113%
MgO -----	0.331%
SO ₃ -----	0.219%
	<hr/>
	89.436%
Residue in 1-1 HCl -----	3.361%
Water (red heat) -----	7.205%
	<hr/>
	100.002%

The residue is white and contains no schreibersite nor other alloy. Its composition is:

SiO ₂ -----	78.56%
Ferric oxide and alumina	
R ₂ O ₃ -----	13.74%
Na ₂ O -----	3.15%
K ₂ O -----	4.55%

The circumstances surrounding the finding of this body were given me by Mr. Brown as follows: "I found the specimen 4 1-4 miles west and 1 3-4 miles north of the depot at Coldwater, Kansas. (These distances might vary a few rods.) It was located in the N. E. quarter, Sec. 5, Range 19, Twp. 32; in the S. E. quarter of the N. W. forty of said quarter. It was found sometime during the middle of May, 1918."

Notes on Kansas Meteorites

METORIC FALL OF DECEMBER 17, 1923

Paper 39 of the 1924 Meeting at McPherson

H. H. NININGER

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On December 17, 1923, at approximately 9:00 p. m. another meteor was seen by several students of McPherson College who reported to me the next day. A notice through the press brought information which indicated that it was more than a shooting star. The general location of its disappearance was determined to be in the vicinity of Whitewater, Kansas. Up to this time I was not convinced that the body had been of important size. Nevertheless, reports of violent shaking of buildings in several places kept reaching me and

I asked Professor B. E. Ebel of our institution to gather further information regarding the matter while on a trip to Hillsboro. He reported that Mrs. P. C. Hiebert was coming upon the front porch of her residence to enter the house, which faced the east, when her attention was attracted to a very extraordinary light. Looking to the southeast she witnessed a large ball of fire disappear behind the east end of the house just south of her. Her husband, Professor Heibert, who was in the house, saw the light but not the source of it. After what seemed two minutes a sound as of thunder was heard and the windows and doors, as well as the dishes in the cupboard, rattled quite violently.

Prof. Ebel also learned that a young man named Schellenberg was walking along the street of the same city when he saw the remarkable "fireball" and after walking about two blocks was just in front of the residence of the banker, Mr. P. F. Friesen, when he heard the sound. In a few moments Mr. Friesen came and opened his front door and inquired of Mr. Schellenberg whether he knew who had been shaking his door. Numerous other persons of the same city saw the phenomenon, only two of whom have been consulted by the writer. These were Misses Marietta Byerly and Mamie King, teachers in the high school. Their reports agree substantially with what has already been given. All indicate that a body passed to the east of Hillsboro, traveling in a southward direction, and that it disappeared about 10 to 15 degrees above the horizon. Some thought it exploded, while others thought that it merely "went out".

Four persons in Marion who had seen the body descend were interviewed by the writer. These all agree that the meteor passed to the west of that city and was traveling in a southward direction. Those whose views were unobstructed by trees saw the light go out a little west of south and near the horizon. To some it seemed to explode, to others it merely "went out". A rumbling sound similar to loud thunder was heard but without the sudden clap of thunder near by. Houses were caused to vibrate so that doors and windows rattled more or less violently. Mr. J. B. Stuart, high school coach in Newton, was walking along the street in company with his wife when the meteorite fell. Having studied astronomy in college, he made a special effort to determine as many facts as possible regarding the phenomenon. According to his observation (made without instruments) the meteorite first attracted his attention when about 15° north of east and at an altitude of 55° to 60°. It traveled at an angle of about 30° with the horizontal and exploded 25° south of east and at an altitude of 25°. When they had walked about a block, which he estimates to have required from one and one half to two minutes, a rumbling sound was heard which continued for some seconds, increasing to almost a roar. No sharp sound was heard, but a sound such as is produced by blasting a few miles away. After the explosion, which produced a number of sparks, Mr. Stuart was able to discern only one piece descending as a red spark. This piece fell very much more abruptly downward than the former course of the

meteorite. The velocity at which it fell would indicate that it was a body of some weight. Later determinations prove that the distance of the explosion from Mr. Stuart was about 17 1-2 miles.

From El Dorado, to the southeast of the point of its explosion, four witnesses have been interviewed on the very spots from which their observations were made, and the reports coincide almost exactly with that of Stuart in Newton, except that they of course saw the explosion to the northwest. In other words, it was about midway between them, which would throw its location just northeast of Whitewater. Only one person of the four in El Dorado saw the piece descend after the explosion. His testimony agrees very well indeed with what was seen from Newton. No one of the four had recorded in degrees the altitude of its disappearance, but by having them point out to me by means of objects such as stars, or by branches of trees through which they were looking at the time they saw the body fall. I was able to discover a very good agreement among them as to the altitude at which the light disappeared. Three of them placed its altitude at from 18° to 20° , while a fourth rather uncertainly located it at an altitude of 35° . The distance from El Dorado to a point of explosion, as later determined by nearby observers, was 17 miles. So an average of the El Dorado reports agrees very well with that of Mr. Stuart in placing the altitude of its disappearance at 20° to 25° degrees for observers at a distance of 17 miles. In the matter of sound the reports from El Dorado indicate about the same degree of disturbance as was reported from Newton.

In Wichita, 28 miles S.S.W. from the point of disappearance of the meteor, several observers were interviewed. Here the work of Dr. Carreau, optician, was of great value, as was that of Mrs. O. S. Rich. Both of these people possess clear minds and were able to give rather definite information. In fact, Dr. Carreau, by using his observations and those of Mrs. Rich, who was only 13 miles away, directly south of him, was able, working independently of the writer, to designate a point within a few miles of where the body actually disappeared. The phenomenon was seen by many Wichitans, all of whom agree as to its general location.

The next important step was a trip to Whitewater. Here through the co-operation of Mr. Davis, the local editor, we were put in touch with Mr. and Mrs. Nellin, both of whom chanced to be on the street in different parts of the village, and were able to give independent reports which agreed substantially that the light disappeared at an altitude of about 60° and directly northeast. Mr. E. C. Lewis, who was out in his yard at the time, 5 miles south and 2 1-2 miles east of Whitewater, saw it due north of him, and two members of the Jake Harter family, living three miles north and five east of Whitewater, who were in the yard, within a few feet of the northeast corner of their house, saw the light disappear at an altitude of 65° and slightly north of west. Three of these parties report violent detonations, and many people in the community saw the light and heard the thunder out of a clear sky, but failed to locate the source of the light or to

connect the sound with it. That none of the people who were nearest to the location of the fall saw anything descend after the light disappeared may be explained by the fact that everything was inky dark following the intense light. And all report that having had no previous experience with such phenomena it never occurred to them to look for anything of the kind.

According to the angles at which the body was seen from Newton and Eldorado, points about equi-distant on either side of where it disappeared, the altitude must have been about six or seven miles at the time of the explosion. According to observers in McPherson and Newton the meteorite traveled at an angle of approximately 30° with the horizontal. If this course were kept up until it struck the earth it should have traveled from ten to eleven miles farther south. But from the testimony of Mr. Stuart of Newton and of Mr. Peffley of El Dorado, the only persons who reported seeing a body fall after the light had disappeared, it should have come to earth from four to five miles south of the point at which the explosion occurred. This would place its location in the central part of Milton Township, just northwest of Brainard.

That the course of the meteorite was approximately due south is shown by the fact that it was seen to fall straight downward directly north of Ponca City, by two men of that city, and from the observations in Hillsboro and Marion, which indicate that it passed about midway between those two cities.

My conclusions are that on the night of December 17, at about 9:00 p. m., a meteorite of considerable size fell in Milton Township of Butler County, Kansas. It traveled directly south and descended at an angle of 30° with the horizontal, and exploded when about six or seven miles above the earth, flying into several pieces, one of which was of sufficient size to be plainly seen from a distance of 17 miles when giving off only a glowing red light, and of sufficient density to descend at a rapid rate of speed, and was finally lost sight of in the darkness at an altitude of something like two or three miles. Other pieces may have been equally large or larger, but if so they did not glow so as to render them visible at this distance. Since the body exploded at a comparatively low altitude the fragments are probably not deeply buried and may come to light in the process of tilling the land, most of which in this locality is in a state of cultivation.

Another Kansas Meteorite

Paper 28 of the 1925 Meeting at Manhattan

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On November 9, 1923, at 8:57 p. m., while standing with Professor E. L. Craik on East Euclid Street in McPherson, Kansas, the writer was privileged to witness the descension of a meteor which in bright-